How pedagogical research can enhance teaching and learning: one academic's personal account

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Abstract

This paper offers a narrative account of the journey of one academic in the School of Computing and Engineering through the early stages of a professional doctorate in the Department of Educational Research at Lancaster University. Focusing on the first three phases of this programme, the author highlights how the experience facilitated deepening engagement in pedagogical research, leading to the adoption of practices which have generated increased rates of student retention and progression, and to the presentation of research findings in these areas to internationally recognised technology-enhanced learning conferences.

Introduction

I first began lecturing in web development in the then School of Computing and Mathematics here at the University of Huddersfield in January 1998, and when I took the post it was my intention to pursue a doctorate in the field of internet development; within eighteen months it became clear not only that if I didn't start a PhD I wouldn't finish one, but also that if I did start one I probably wouldn't finish one either. The web was still less than ten years old, and developing so rapidly that the content of the modules I was teaching was already fast becoming out-of-date by the time a second iteration began, with new technologies and new patterns of usage emerging, evolving and disappearing at such a rate that any attempt to pursue even a full-time three-year research programme would have seen the final thesis an internet-generation removed by the time I reached the *viva voce* examination.

The twists and turns of life, including running a web business in my spare time, and then starting a family, all overshadowed my PhD aspirations for almost a decade, but when the doctoral programme in e-Research and Technology Enhanced Learning at Lancaster University was recommended to me in mid-2008, my dormant interest was sparked back into life. Paradoxically, I realised, I had been teaching in higher education for over ten years, yet 'inactive' in the education system for some time; suddenly, here was an opportunity to 'get back into education', not by embarking on a three-year full-time research project with an 80,000 word thesis as the output goal, but by engaging part-time in assessed modular content for two years to prepare me for a two-year project and a 50,000 word thesis.

The early days and Self-Peer-Tutor Assessment

The opening phase of the doctoral programme began in February 2009, and with the benefit of hindsight it is clear that the activities we engaged in over the course of the first fortnight formed a textbook exercise in getting an online distance learning community off the ground. During the initial induction we uploaded a photo and provided a personal profile, and met the other members of what was to become our learning community - our cohort numbered sixteen, with learners based across three continents and spread around the world from the Canadian west coast to the eastern US seaboard, through the UK and Palestine and on to Hong Kong and Japan. The first module of the programme introduced us to *Research Methods in Education*, and after two short weeks of asynchronous discussions and reviews of papers, we split into three self-selecting learning sets and began our first collaborative exercise creating learning materials on different research methodologies. For the first time, we actually spoke to one another via *Skype*, and it quickly became apparent that although the discussion forum yielded opportunities for one kind of learning, it was through a synchronous voice-based exchange that we were able to properly get to know one another. When we all arrived at the residential, it was interesting to note how much closer individuals were with the members of their respective learning sets with whom they had spoken, than with members of other learning sets with whom they had previously exchanged only asynchronous text-based messages.

Once the residential was over, it was time to start our first piece of research; with the emphasis placed more on methods than methodology at this stage, we were each required to conduct a small-scale qualitative study examining some relevant aspect of our professional practice. It was now May however, and with most of our students having submitted their final pieces of coursework some three weeks earlier, I was aware that conducting any investigation which required responses from learners carried an inherent risk of generating insufficient data. After some deliberation, I therefore embarked on an investigation into academic perspectives regarding the application of self-peer-tutor-assessment in undergraduate programmes of study within my own department.

My research design involved the use of questionnaires and follow-up semi-structured interviews; a number of colleagues were happy to help but had their own marking to contend with, so my first lessons in doing qualitative research quickly became about timing and persistence. Eventually of course, the marking was over and my colleagues were available to be interviewed. The students which my colleagues and I teach are all pursuing qualifications in the digital media subject area, and in contrast to the findings of studies which have examined peer assessment with groups of mature students taking a postgraduate qualification in education by distance learning (e.g. McConnell, 2006; Chesney & Marcangelo, 2010), the over-riding message was that our undergraduates would not engage constructively in the self-peer-tutor assessment process unless they were first taught how to do so. The near absence of the required frames of reference and appropriate vocabulary were identified as barriers to achieving significant success with undergraduates, however there was considerable agreement that the strategy could work well with final year students who were close to graduating and on the cusp of being eligible to take up postgraduate work.

This first phase of the doctoral programme had seen me taking my first tentative steps as a novice educational researcher, and while the outputs which emerged from these early days were modest, the investigation into how self-peer-tutor assessment might work with our students was later to inform the implementation of a peer assessment strategy in a module I came to lead; I was also able to apply the lessons from my experience of engaging in the formation of our online learning community to the development of a blended learning community at Huddersfield.

The development of professional practice
In this next section I move on to talk about the second phase of my studies, leading to the

examination of the relationship between contemporary educational theory and colleagues teaching in the numerate disciplines, and culminating in the acceptance of my first conference paper.

With the focus shifting to the development of professional practice, the next module followed immediately on from the peer assessment mini-project, and we were quickly thrown into asynchronous activity discussing concepts from seminal work in contemporary educational theory, focusing on communities of practice (Wenger, 2007), situated learning (Lave & Wenger, 1991), and the role of the tutor as coach or mentor (Schön, 2000). It was as we were working through these readings that I began to get the feeling that I'd come across ideas such as these somewhere before, but I couldn't quite put my finger on where right away. A number of breakout debates sprang up, including one in which the philosophical validity of knowledge being collaboratively constructed and all meaning being socially negotiated was being explored. One of the cohort insisted that there could be no truth other than subjective truth, claiming that the statement "2 + 2 = 4" was only true if we agreed it to be so. As an academic in Computing and Engineering, this misunderstanding of the concept of number naturally caught my attention, but it occurred to me that this was connected with another debate which had been looking at why academics in some disciplines were more resistant to adopting contemporary educational practices than others. While reflexivity and learning through discourse seemed to come relatively naturally to those studying within the social sciences, it was understandable from an insider perspective that the discipline of many of the mathematicians, computer scientists and engineers meant that they did not care for "fluidity of meaning" (Prawat, 1999, p. 264), and when faced with requests to adopt a pedagogy based on a social constructivist position and a subjectivist epistemology, it was perhaps not surprising to find the baby thrown out with the bathwater.

A lesson from history
By now it was late July; almost all academic staff had gone on leave, and there were even fewer students around campus. Knowing that access to participants would be even more difficult to achieve than in May I struggled to formulate an appropriate research project, so opted to take the literature review route for this assignment. That was when it suddenly clicked into place where I had encountered some of these ideas previously; as an undergraduate I had read Philosophy, and during my final year had taken a module on political philosophy in which we had looked at, amongst other things, anarchism. Suddenly, I was taken back to smoke-filled seminar rooms of the late 1980s where we had discussed the notions of property as theft, integral education, the collapse of the student-teacher hierarchy and the concept of mutual aid. As I dug deeper, I found that not only had the nineteenth century anarchists Pierre-Joseph Proudhon (1851), Mikhail Bakunin (1916), and Peter Kropotkin (1987) produced work which had promoted a similar approach to that of the contemporary educational theorists, but that this theme had continued through the twentieth century work of Paul Goodman (1962) and Ivan Illich (1971), and was also the focus of twenty-first century work emerging from the Institute of Education (Suissa, 2001, 2006). The relationship between the quantitative sciences and anarchism has long been established (e.g. Kropotkin, 1913), and an anarchist pedagogy (McDowell, 2010a) based on this position requires not only collaborative learning and a collapsed hierarchy in teacher-student relationships, but also allows for the necessary degree of objectivity to allow "2 + 2 = 4" to be non-negotiable, thereby making contemporary practices more palatable to colleagues in the numerate disciplines.

Conferences and my first paper
After going through the peer review process, I completed the literature review by the start of September and submitted this as my paper for the module, firmly believing that I should continue to collapse the traditional hierarchy wherever possible, but imagining that this would be the end of the matter. I hadn't been to an academic conference since my days as a Research Assistant working in environmental education some fifteen years previously, but

the next morning I was off to Manchester for the Association for Learning Technologies Conference (ALT-C 2009), where I was hoping to get myself into the swing for our own Teaching and Learning Conference the following Monday. I'd read beforehand that INSPIRE would take a different approach to previous events, but hadn't anticipated that there would be an opportunity to run an impromptu session of my own, so as soon as this became apparent I was adding "Anarchy in the University: Collapsing the Student-Teacher Hierarchy" to the list of session titles running in the first slot. I didn't really know what to expect, but was delighted to find well over twenty colleagues from Schools across the university joining together on the fifth floor of Canalside West to talk about the likely effects on student creativity and learning that could be achieved through the adoption of an anarchist pedagogy, and pleased to find that we had enough to talk about to take up the full 90 minutes before the next session started and we had to vacate the room. Inspired by the INSPIRE process, I began to wonder about presenting on the anarchist philosophy of education at other teaching and learning related conferences, and following a reworking of the literature review I'd submitted to Lancaster, I was very pleased to have a paper on the student-teacher hierarchy theme accepted for presentation at the Learning Futures Festival 2010, hosted by Professor Gilly Salmon at Leicester University (McDowell, 2010a).

This second phase then, in addition to uncovering a new perspective on how key messages from contemporary educational theory could be presented within numerate disciplines, had enabled me to get acquainted with the literature review process upon which a final thesis would be based, and had also yielded the opportunity to secure my first conference paper presentation, something which I had expected would take much longer to achieve. Aware that the conference paper was in many ways simply another modest step forwards, it nonetheless represented a significant development in my process of transformation, and there was no doubt in my mind that this was an important psychological hurdle to have overcome, providing me with renewed impetus as I approached the next phase of my doctoral studies.

Applying pedagogical research to a real-world situation
Although the second phase of the PhD had allowed me to make new connections in the field of theory, it was primarily the *application* of educational research which had originally drawn me to the doctoral programme. Coinciding with the start of the third phase at Lancaster was the beginning of a new academic year at Huddersfield, and one of the first things to address before teaching commenced was an issue likely to cause problems for one of our students diagnosed with Asperger's Syndrome. Back then, I didn't know that much about autistic spectrum conditions, other than what I'd gleaned from the media coverage of the US government's attempts to extradite Gary McKinnon on charges of hacking into military computers, and from a brief meeting with a friend's son whom I'd noticed seemed to have an almost innate grasp of how to mend computers and configure networking hardware.

In a meeting with the student (whose name I have changed here to protect his confidentiality and will refer to as 'Alex') and a Disability Support Worker from Student Services, it quickly became apparent that participation in group work was likely to be deeply problematic for a student with Asperger's Syndrome, and that the social cues which neurotypical peers would pick up from face-to-face communication would be missed. As the new Module Leader for a module which required students to work together collaboratively to produce a computer game, I was acutely aware of the need to provide students with the opportunity to work together in the way they would be expected to when entering the games industry, however here was a student for whom the provisions of the Disabilities Discrimination Act (1998) and the Special Educational Needs and Disability Act (2001) applied, and for whom a positional tension clearly existed. The work I had been doing on peer assessment and the collapse of the student-teacher hierarchy now took on a new relevance, and in considering Alex's situation I began to see connections between the two; for a student with Asperger's Syndrome, not only would participation with peers in group work be troublesome due to

missed social cues, but so too could the traditional student-teacher hierarchy that went with the old-school 'chalk-and-talk' approach to teaching and learning, and this led me to wonder whether a technology-enhanced learning intervention might be appropriate here.

As I was about to take on leadership of this module for the first time, I had already looked at how the module had previously run, and had identified that the traditional approach to documenting the game development process was causing a large number of students to lose out on a significant proportion of the overall marks for the module, placing them in a referral position, or even failing the module outright. Clearly this had been having a knock-on effect in terms of rates of both retention and progression, and on the strength of some of the research I had been engaged in at Lancaster, I had identified an eportfolio system which I was about to roll out to support students with this element of their work. By replacing the traditional end-of-process documentation with a weekly blogging exercise, I was encouraging students to reflect on their learning while fulfilling the documentation requirements as the game was developing; by making a system available which combined social networking features, I was intending that students would also be more inclined to use the eportfolio to work collaboratively; and by encouraging learners to provide feedback on peer's work over the course of the year, I was hoping that they would become accustomed to using the essential vocabulary required to engage constructively in the summative peer assessment process. I mentioned all this to Alex and his support worker, stressing that I would be monitoring his situation with respect to the group working requirement, and he agreed to give it a go.

Towards a blended learning community
My desk-based research at Lancaster had indicated that tutor involvement in the online component of a learning environment was essential in order to foster the sense of community which would lead students to engage with the system (e.g. Salmon, 2000; Palloff & Pratt, 2005; McConnell, 2006; Smith, 2008). As a web programmer, I was quickly able to recognise how the system worked, and at the first teaching session of the year I unveiled the *Mahara* interface, showed the students my own profile, demonstrated the blogging facility, and highlighted the opportunities for uploading and sharing content with peers. Following the pattern set by the tutors at Lancaster, I then requested all students to complete their own profile and upload a photo in the first two weeks of the semester. Within two hours it was clear that my expectations of the first fortnight had already been massively exceeded; not only had every student 'moved in' and made themselves at home, 'friending' me in the process, but evidence was emerging that the group had taken ownership of the system, with a number of special interest group debates already raging in forums newly created by the students themselves – not all of which I had been invited to join!

Following my meeting with Alex, I spent time acquainting myself with the literature regarding Asperger's Syndrome, and the expert analysis confirmed that the most likely outcome of asking Alex to engage in group work was failure. My background reading had uncovered one particular case study of a student at a Birmingham university who had become ill as a result of attempting to play a part in an assessed group work exercise, and had ultimately withdrawn from the institution altogether (MacLeod & Green, 2009); I was determined that this was a pattern which would not be repeated here. What happened next however, was quite unexpected and proved highly significant; when I looked at the area in *Mahara* which Alex's group were using, I found that the very first discussion forum had been created by Alex himself, that he had opened up the discussion, and was actively seeking feedback from his peers on ideas for the game development upon which they were about to embark. This appeared to run contrary to all of the established literature I had encountered relating to collaborative working and Asperger's Syndrome (e.g. Twachtman-Cullen, 1998; Lewis, Trushell & Woods, 2005; Benford, 2008), and recalling an INSPIRE session at the Teaching and Learning Conference 2009 about working with students with Asperger's Syndrome, I contacted the academic who had led the session and referred this to them, asking for their

viewpoint. Quickly it became clear that this was most unusual, and it was suggested that I should research this further.

Asperger's Syndrome and technology-enhanced learning
At Lancaster University meanwhile, the focus had moved on to educational affordances of technology-enhanced learning interventions, with the emphasis in the research project exercise switching from methods to methodology, and the opportunity naturally presented itself for me to formalise a research design incorporating a case-study methodology, employing qualitative methods to investigate further. Around the same time, in the middle of November, a colleague reminded me of the upcoming opportunity to submit a bid to the University's Teaching and Learning Project 2010 Fund, and following confirmations of interest from academics in the Schools of Computing and Engineering and of Human and Health Sciences, a bid was duly submitted. By now I had become increasingly aware of the higher than average incidence of learners diagnosed with an autistic spectrum condition within the computer games subject area, and building on the early observations of Alex, the aim of the project was to foster a community of learners which would be fully inclusive of our learners with autistic spectrum conditions such as Asperger's Syndrome, using the eportfolio system as a communications tool to stimulate reflexivity and collaborative learning, while providing high quality subject content in the form of a repository of video tutorials to assist in the development of game development skills.

The bid was successful, and the *UoHTube* project began in January 2010. Learner generated content was a concept I had recently encountered, and as the video tutorials were to be developed primarily for computer games students it seemed sensible to engage learners in the process of identifying which areas they had struggled with and might have found supplementary materials useful. This exercise in itself encouraged further reflection upon the learning process, and the act of self-identification of areas of weakness acted as a spur for improvement in those areas; a group of students agreed to act as a focus group to evaluate the prototype tutorials, and as a bonus, some have since volunteered to develop their own materials for inclusion in the repository, keeping it alive, up-to-date, and very much learner-centred. It was especially important to consider the special requirements of students with an autistic spectrum condition, and background research indicated that hyper-sensitivity to audio inputs was a major factor which led some learners with Asperger's Syndrome to disengage in classroom situations (Attwood, 2000; Baron-Cohen, 2008). In conjunction with another key consideration, the issue of non-verbal indicators and social cues being missed by Asperger's Syndrome learners in face-to-face communication, the use of video tutorials appeared to offer an ideal alternative to the 'slides and talk' approach, with the proviso that learners should be encouraged to continue participating in the collaborative learning process, and maintain the sense of community which the project was aiming to engender.

The case-study and the conferences
Buoyed by the acceptance of the paper at Leicester a few months previously, and encouraged both by fellow PhD cohort members and colleagues at Huddersfield to submit abstracts on what I was doing to two conferences later in the year, I was once again pleased to have my submissions accepted for presentation.

As the module and the case-study progressed, so the appropriate time to conduct individual interviews with students drew nearer; it had become clear that Alex's written word was significantly more eloquent than his spoken expression, and I therefore employed an e-interview strategy with all members of his game development group to help explore their experience of the group work exercise. An analysis of the transcripts, including pattern-matching for collective-inclusive phraseology, indicated that Alex found the eportfolio system invaluable as a tool to facilitate his participation in the group. In follow-up observations conducted after the end of the case-study period it was notable that not only had Alex successfully participated in a group work exercise, but that he had also begun to show signs

of increased self-confidence and self-esteem, and by the end of the module Alex was observed holding conversations and offering constructive feedback to members of other development groups three rows of desks away, something which he had never previously been able to do. The evidence suggested that this technology-enhanced learning intervention had helped provide a level playing field for this student, and with additional social and educational affordances also uncovered, the year was rounded off for Alex by achieving 'A' grades in more than half of his final year modules.

More generally, it was both encouraging to see that rates of retention and progression to award had improved dramatically from previous years, and gratifying to have contributed to departmental research outputs through the presentation of research findings at the *Addressing Autism and Asperger's Syndrome* conference (McDowell & Austin, 2010), and the *Solstice 2010* technology-enhanced learning event (McDowell, 2010b).

Conclusions
In this paper I have attempted to summarise the first fifteen months of my life as a novice researcher working towards a professional doctorate in educational research and technology-enhanced learning, and I hope that the snapshots I have presented from my journey go some way to illustrate both how engagement in pedagogical research can benefit teaching and learning, and how this can snowball into larger research ventures.

As the title of this paper indicates, what I have presented here is "one academic's personal account", and I fully acknowledge that my own perspective has been very much flavoured by the technology-enhanced learning emphasis of the particular doctoral programme in which I have engaged. I would suggest however, that it is through my connection to pedagogical research facilitated by such a programme of study that I have developed the motivation and focus required to make a difference to the student experience of not only Alex, but learners throughout the subject area, and indeed, through the process of dissemination at conferences, to the wider academic community.

Through the presentation of the phases described here, I have also attempted to illustrate that the relationship between pedagogical research and enhancing teaching and learning is very much symbiotic, with the synergy between professional practice and research focus feeding a spiralling process of problem identification, investigation, implementation and evaluation. In so doing, I hope that this account goes some way to highlight that, as many colleagues are already aware, pedagogical research need not be regarded as the preserve of specialists in schools of education. Moreover, I would suggest that all of us for whom student engagement in our particular subject specialism is an issue have the opportunity to help to sculpt an inclusive environment, technology-based or otherwise, in which learners from all backgrounds and disciplines can benefit.

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